

13. The apparatus (20) of claim 4, wherein the average detector (37.1) is a sliding average detector that continuously generates a mean value of the frequency demodulated signal (demod_lp2).
- 5 14. Receiver (10) comprising an apparatus according to one or more of the preceding claims.
- 10 15. The receiver (10) of claim 14, comprising an analog front-end (10, 14, 15) and a digital back-end (16), said apparatus (20) for determining a frequency offset error being part of said digital back-end (16).
16. The receiver (10) of claim 14 or 15 being designed to receive and process FSK or GFSK modulated antenna signals.

15

1/13

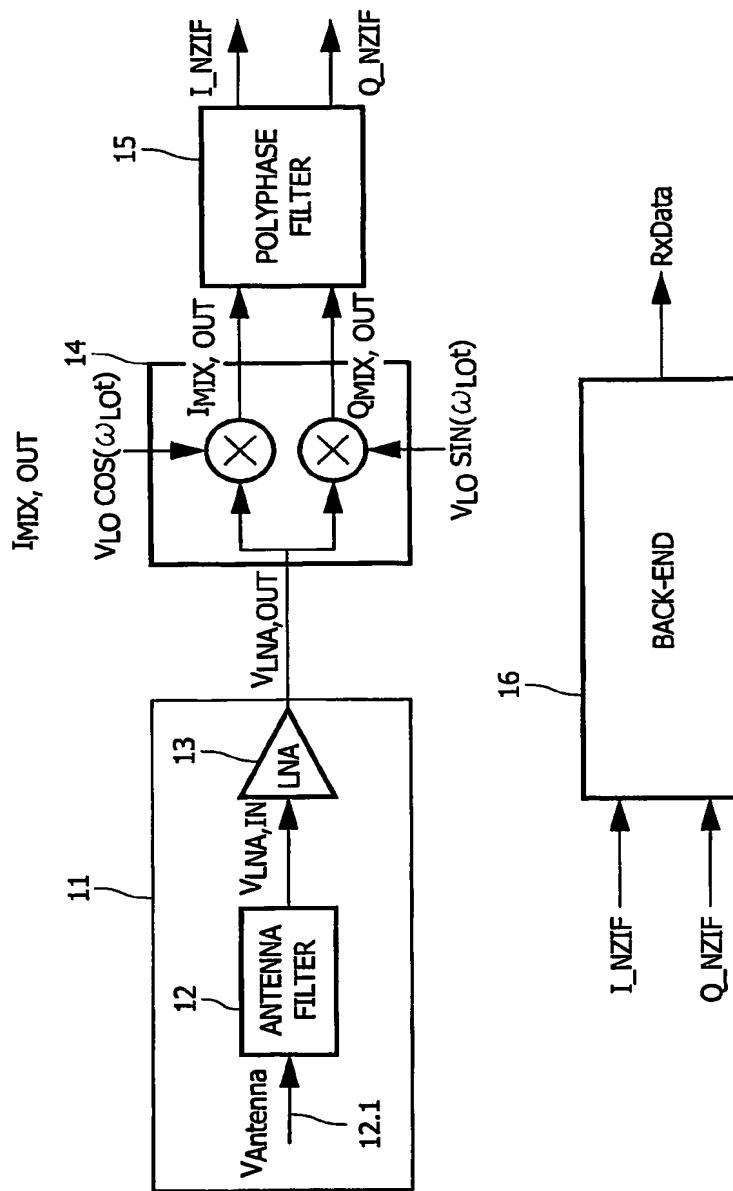


FIG. 1

2/13

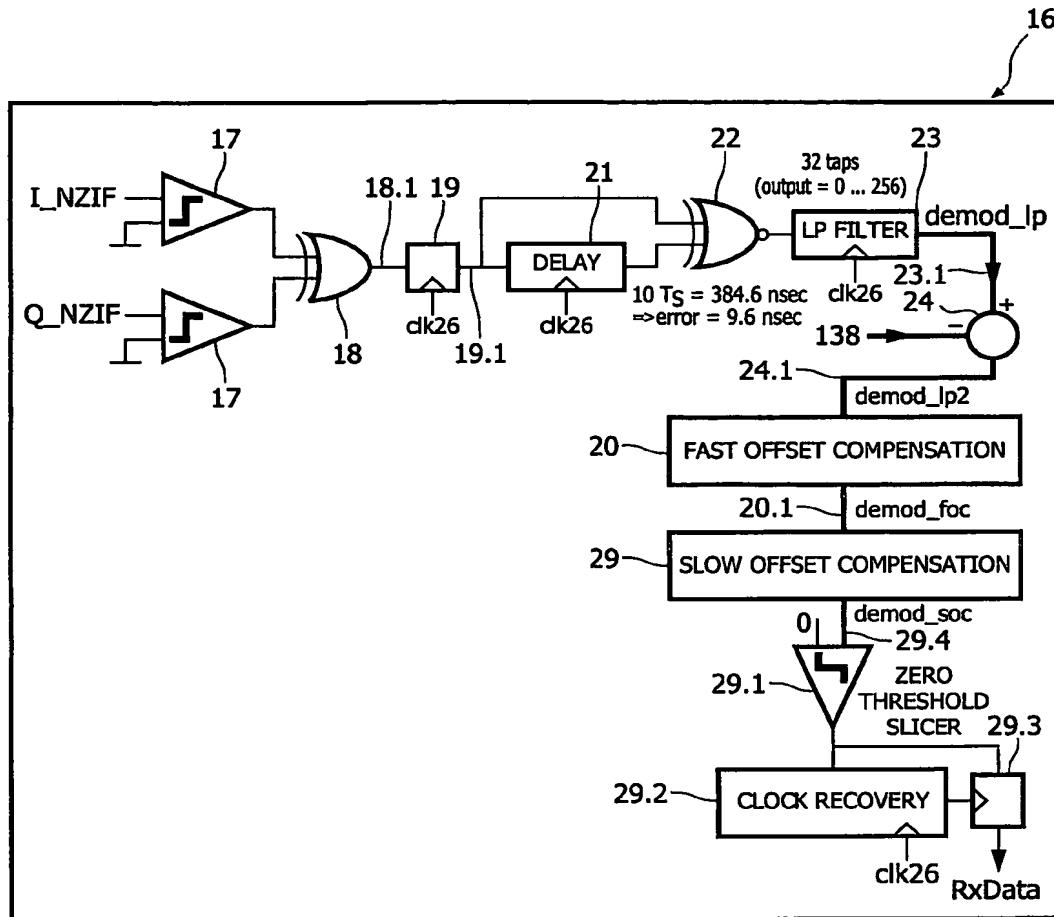


FIG.2

3/13

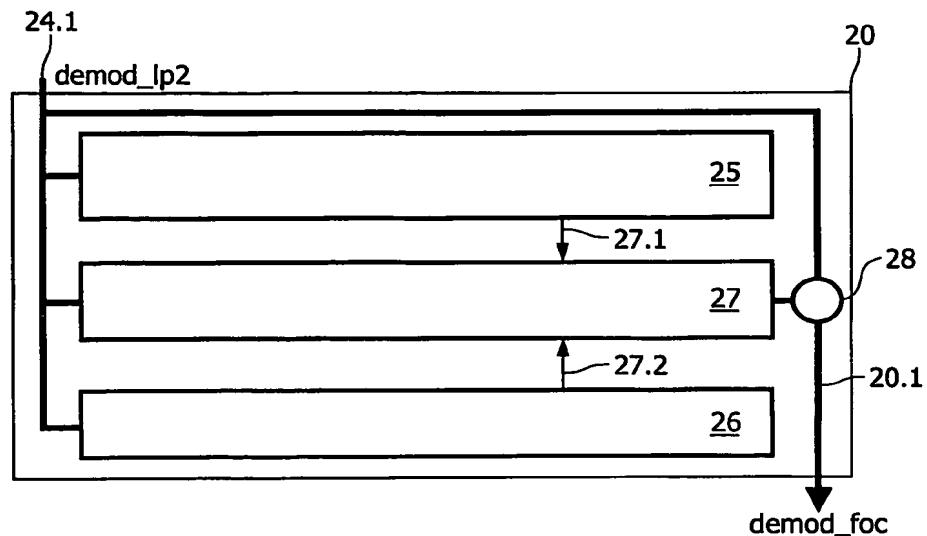


FIG.3A

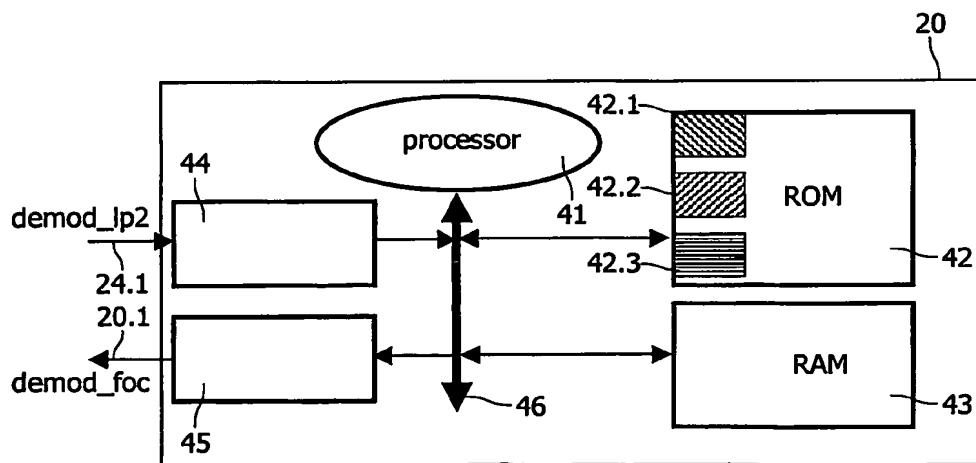


FIG.3B

4/13

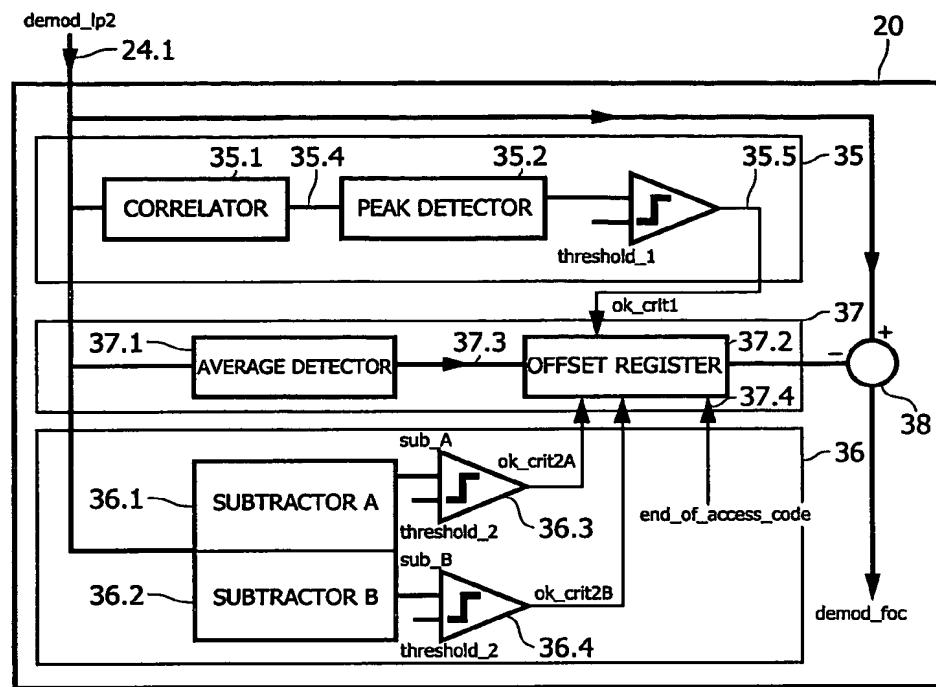


FIG.4

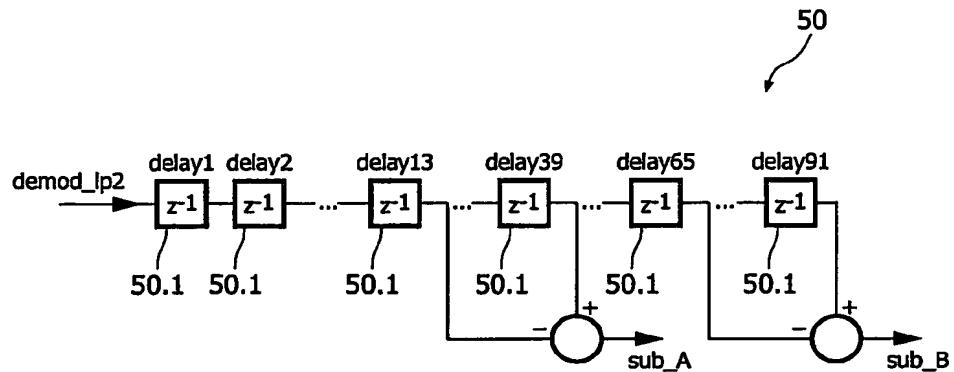


FIG.5

5/13

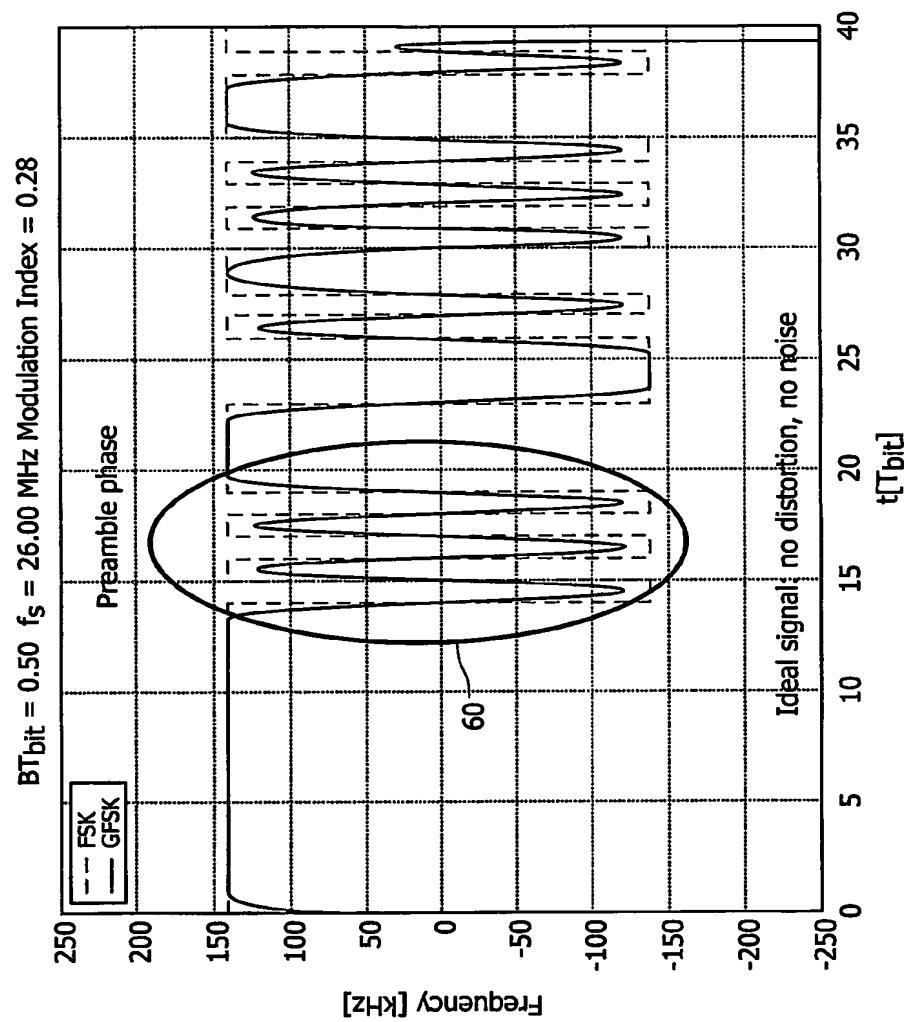


FIG.6

6/13

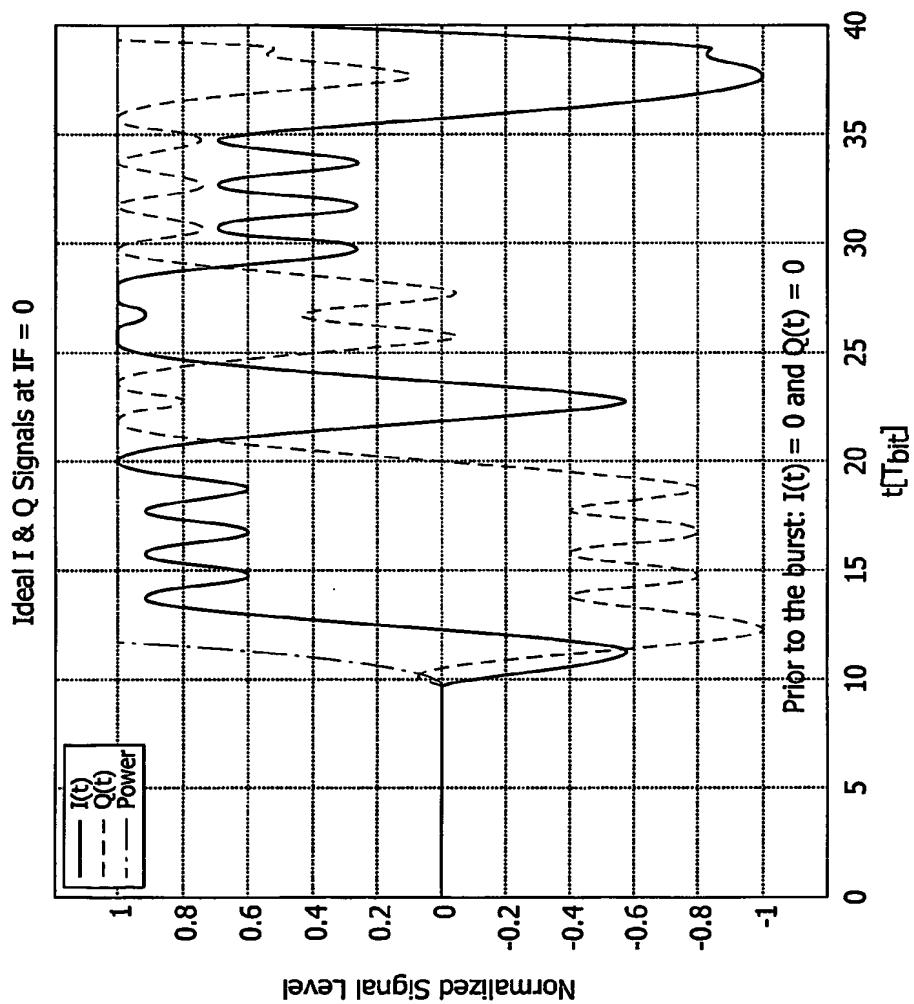


FIG.7

7/13

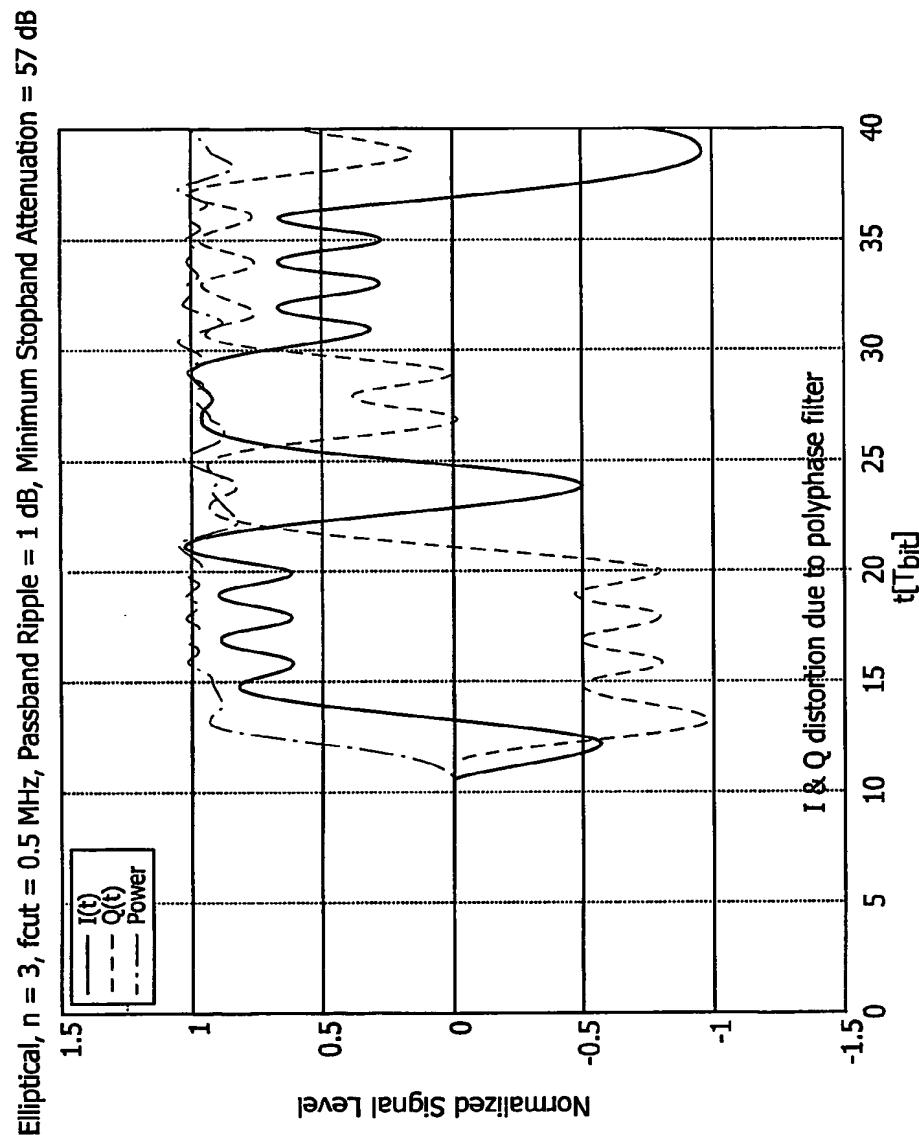


FIG.8

8/13

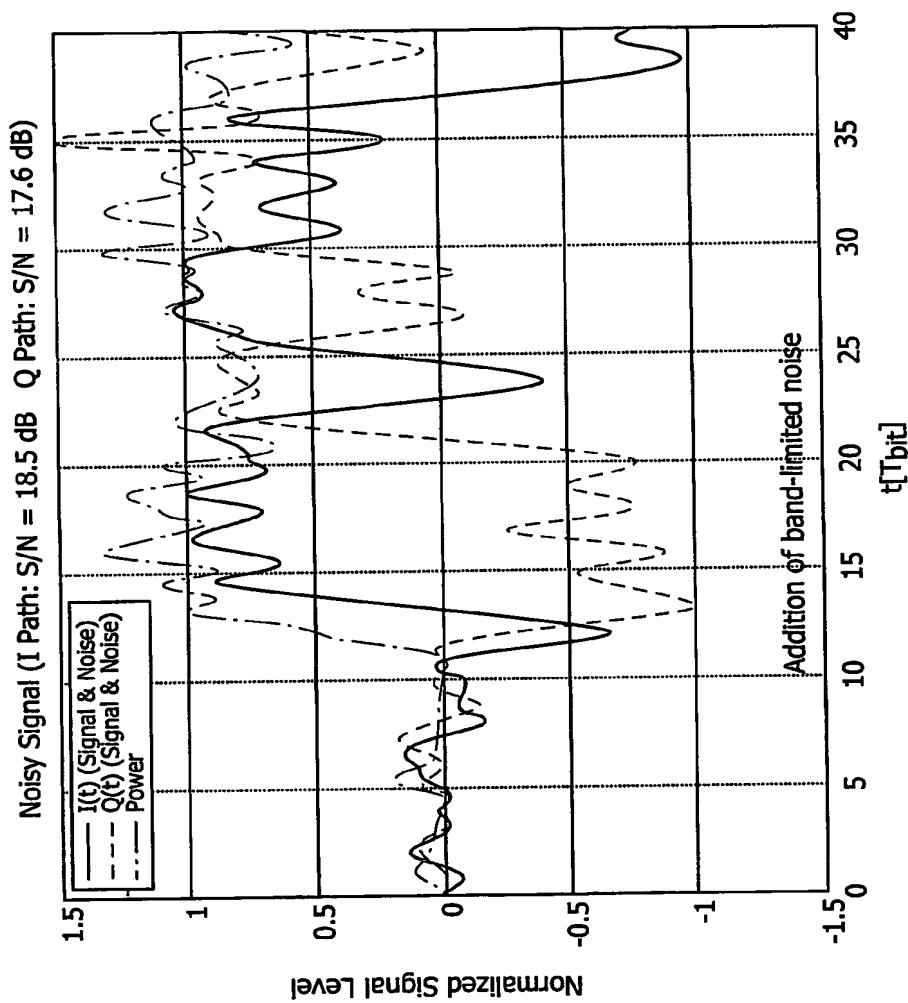


FIG.9

9/13

Example with a frequency offset error of 150 kHz
(Nominal center frequency = IF = 1000 kHz)

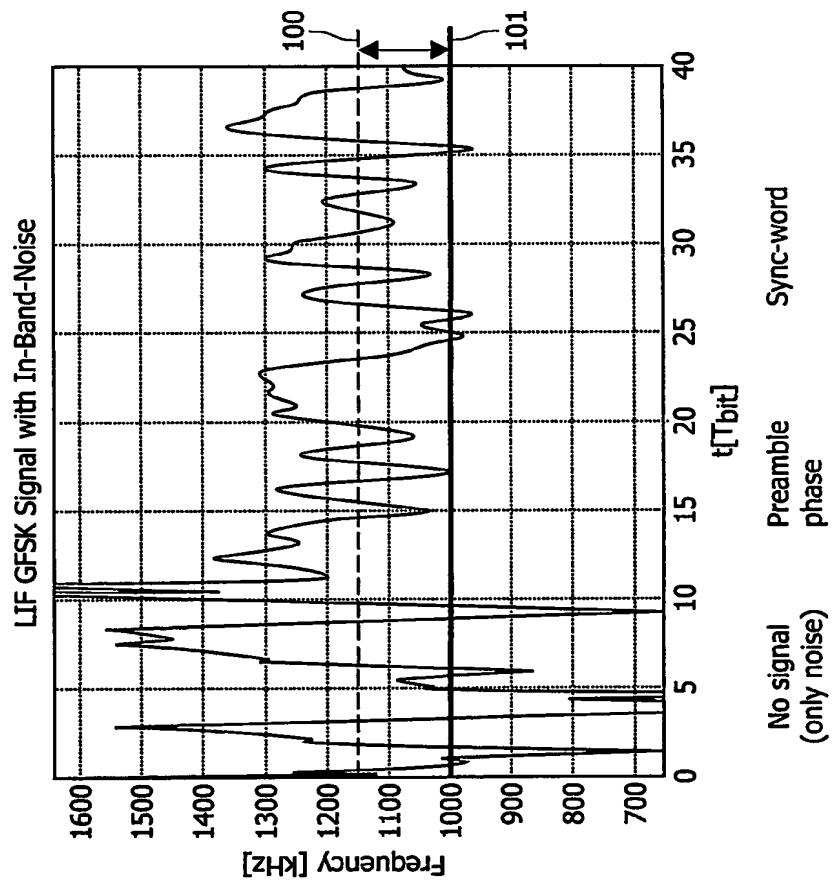


FIG.10

10/13

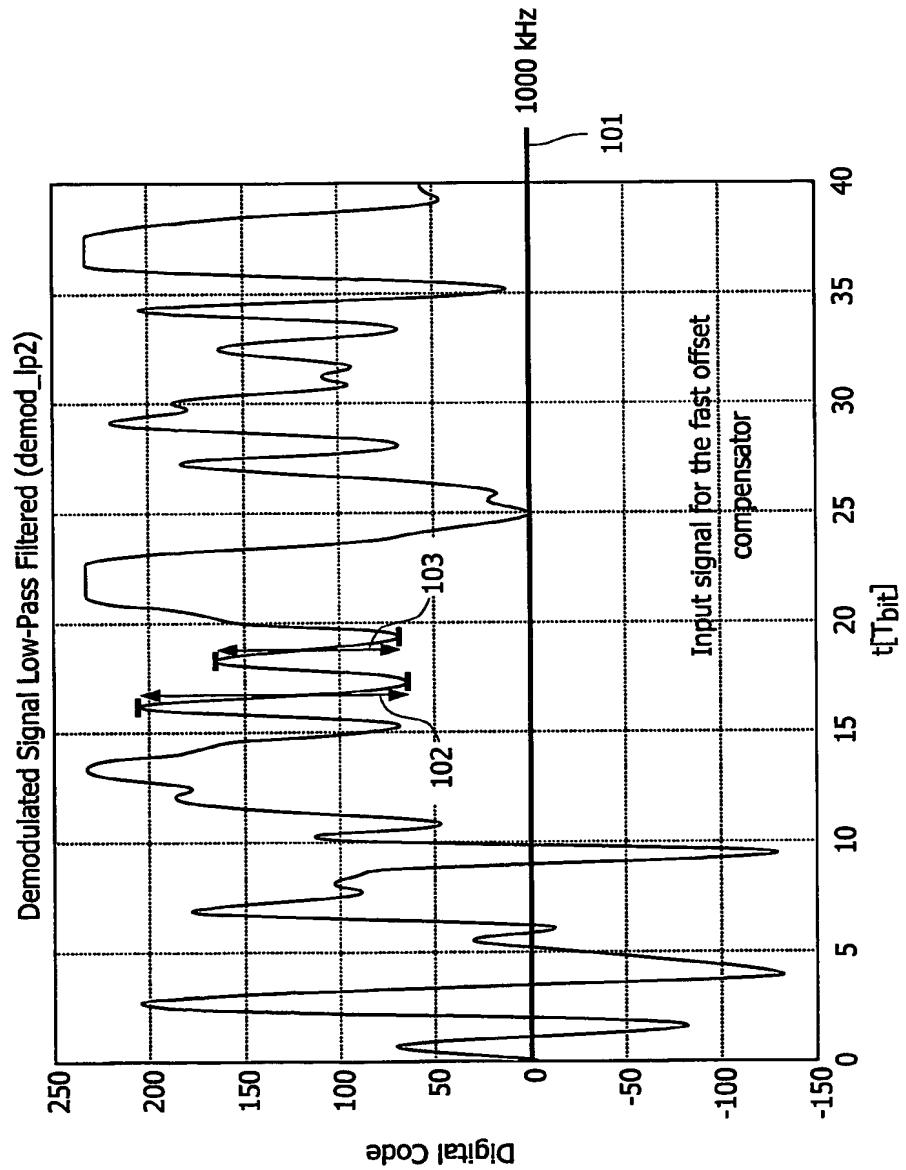


FIG.11

11/13

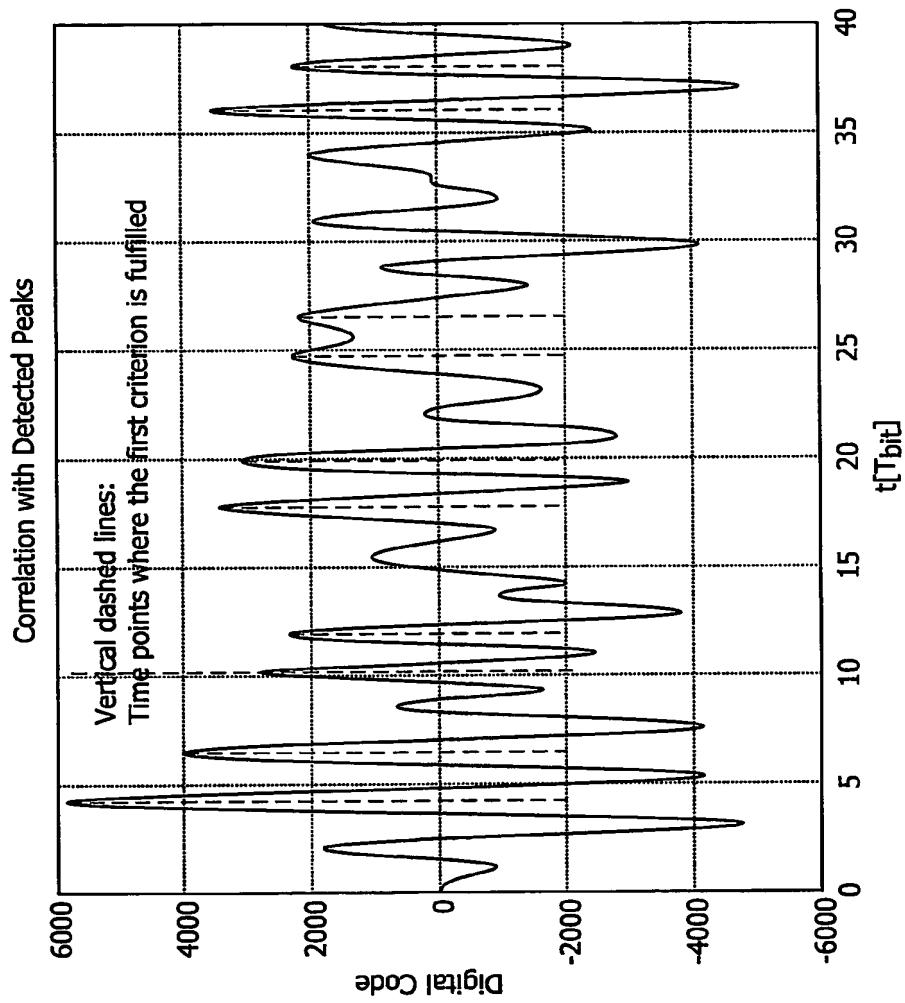


FIG.12

12/13

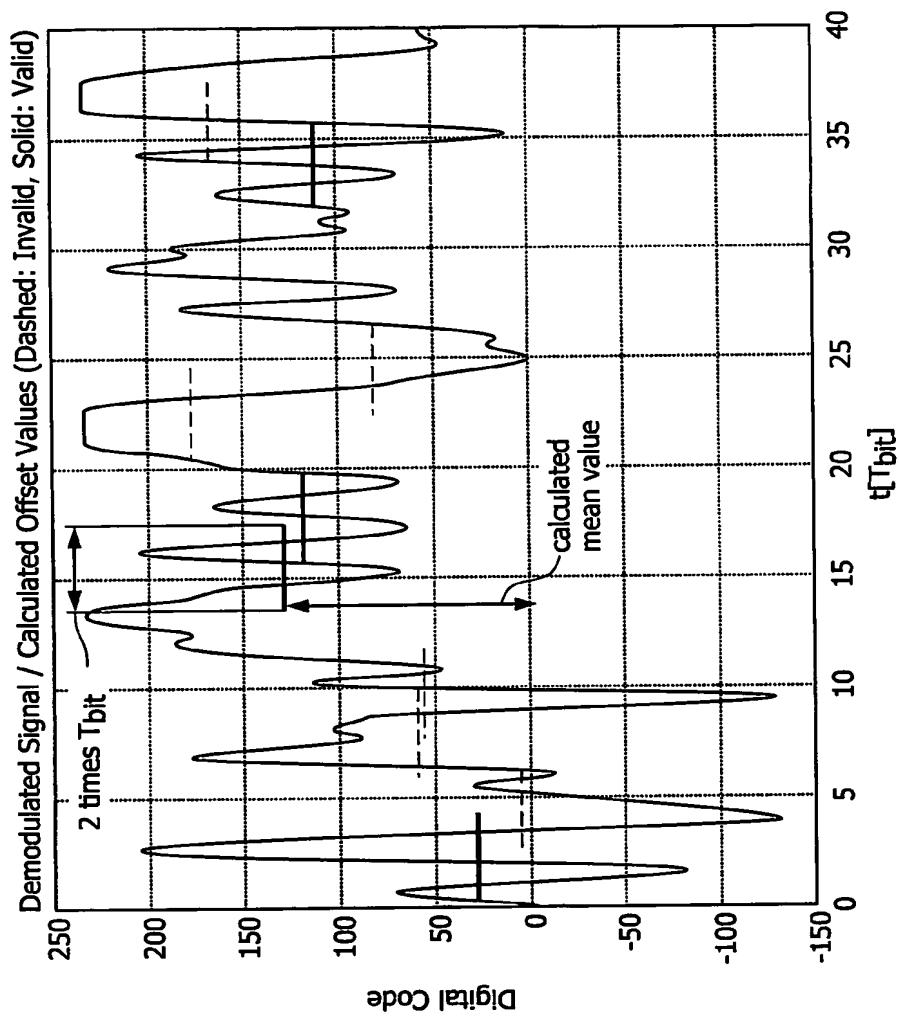


FIG.13

13/13

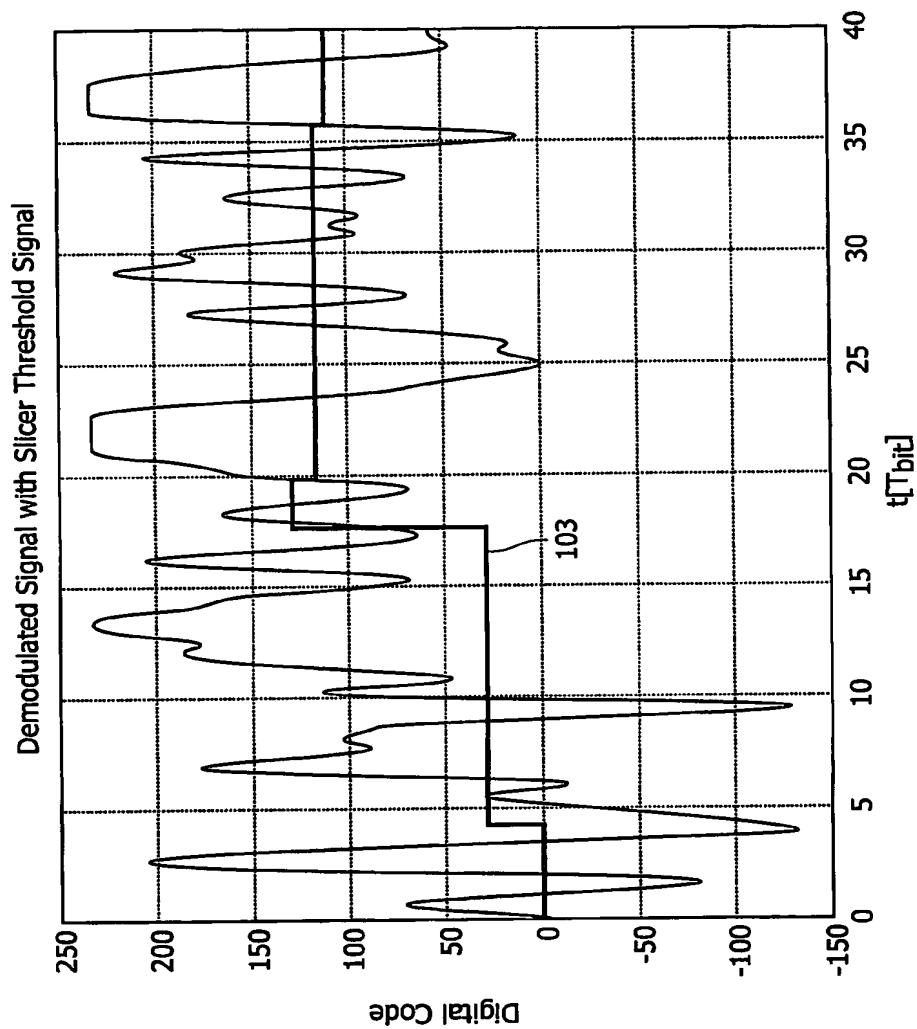


FIG.14

INTERNATIONAL SEARCH REPORT

tional Application No

/IB2004/003562

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04L25/06 H04L27/14 H04L27/152

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document with indication, where appropriate, of the relevant passages	Relevant to claim No
X	US 6 356 608 B1 (ATARIUS ROOZBEH) 12 March 2002 (2002-03-12) column 10, line 6 - column 13, line 11 column 7, line 25 - line 56 column 4, line 62 - column 5, line 51 column 3, paragraph 3 column 1, paragraph 1 abstract -----	1-4, 6, 7, 10-16
A	US 2003/043937 A1 (SHIDA MASAAKI ET AL) 6 March 2003 (2003-03-06) paragraph '0070! paragraph '0065! paragraph '0040! - paragraph '0045! paragraph '0036! paragraph '0002! - paragraph '0008! abstract -----	1-16

Further documents are listed in the continuation of box C

Patent family members are listed in annex

* Special categories of cited documents

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- *&* document member of the same patent family

Date of the actual completion of the international search

13 January 2005

Date of mailing of the international search report

25/01/2005

Name and mailing address of the ISA

European Patent Office, P B 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel (+31-70) 340-2040, Tx 31 651 epo nl,
Fax (+31-70) 340-3016

Authorized officer

Koukourlis, S

INTERNATIONAL SEARCH REPORT

stional Application No
/IB2004/003562

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
A	<p>WO 02/082757 A (CONEXANT SYSTEMS INC) 17 October 2002 (2002-10-17) page 16, line 7 - page 17, line 13 page 14, line 21 - page 15, line 11 page 12, line 9 - line 17 page 10, line 4 - page 11, line 13 page 6, line 14 - line 31</p> <p>-----</p>	1-16
A	<p>EP 1 217 781 A (AGILENT TECHNOLOGIES INC) 26 June 2002 (2002-06-26) paragraph '0016! - paragraph '0025! paragraph '0005! - paragraph '0006!</p> <p>-----</p>	1-16
A	<p>WO 01/26260 A (BRIEN JEREMIAH CHRISTOPHER O ; PARTHUS TECHNOLOGIES PLC (IE); SILICON) 12 April 2001 (2001-04-12) page 10, paragraph 2 page 8, last paragraph - page 9, paragraph 4 page 6, paragraph 1 page 1, paragraph 3 - paragraph 4</p> <p>-----</p>	1-16

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

/IB2004/003562

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 6356608	B1	12-03-2002	AU	757757 B2	06-03--2003
			AU	4943499 A	17-01--2000
			BR	9911714 A	20-03--2001
			CN	1122380 B	24-09--2003
			BE	200000781 A	15-04--2002
			EP	1092289 A1	18-04--2001
			HK	1041122 A1	25-06--2004
			JP	2002519935 T	02-07--2002
			WO	0001095 A1	06-01--2000
			TR	200100371 T2	23-07--2001
US 2003043937	A1	06-03-2003	JP	2003069658 A	07-03-2003
WO 02082757	A	17-10-2002	US	6771720 B1	03-08-2004
			WO	02082757 A1	17-10-2002
EP 1217781	A	26-06-2002	EP	1217781 A1	26-06-2002
			JP	2002237820 A	23-08-2002
			US	2002075974 A1	20-06-2002
WO 0126260	A	12-04-2001	AU	1493801 A	30-04--2001
			AU	1962501 A	30-04--2001
			AU	2112501 A	10-05--2001
			AU	7724500 A	30-04--2001
			AU	7724800 A	30-04--2001
			AU	7834700 A	30-04--2001
			WO	0124357 A1	05-04--2001
			WO	0124415 A1	05-04--2001
			WO	0124420 A1	05-04--2001
			WO	0126260 A1	12-04--2001
			WO	0124537 A2	05-04--2001
			WO	0124376 A1	05-04--2001
			US	6504498 B1	07-01--2003